CTX 78R

VHF/FM Marine Radiotelephone Remote Control Unit

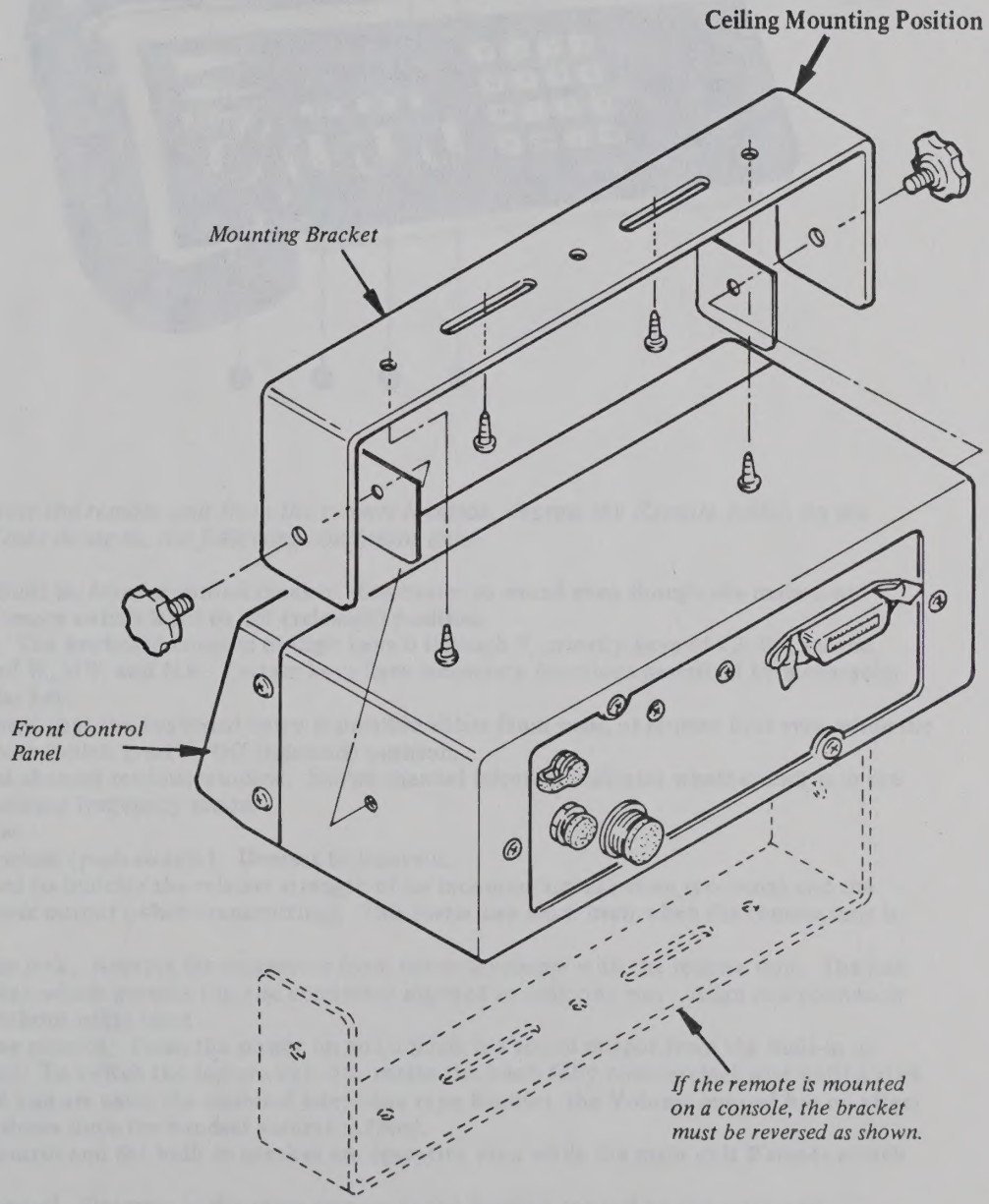
- Fully synthesized US and international channels
- Quick select priority channels
- Memory channels 5 programmable of your choice by simple keyboard entry
- Dual-watch channel 16 monitor
- High-intensity LED channel readout
- Illuminated keyboard and signal meter for night time operation
- Front mounted speaker
- Signal and transmit meter and mode indicators

Installation

Location. Make sure the location chosen is one in which it is convenient to operate the unit. Also bear in mind that the microphone bracket will have to be mounted in the same general area.

Mounting-Bracket. The CTX-78R may be mounted by means of the mounting bracket supplied with the unit. Attach the bracket as shown below.

Overhead mounting. If you want to mount the remote unit overhead on the cockpit ceiling, etc., the mounting bracket should be mounted as shown below. The front control panel will also have to be reversed downward for operating convenience. Ask your local Cybernet dealer for professional service.

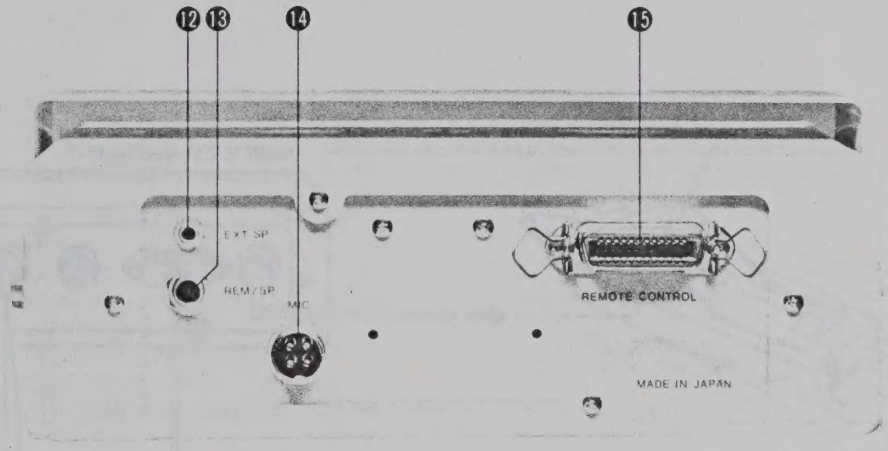

Ceiling Mounting Position
Mounting Bracket
Front Control Panel
If the remote is mounted on a console, the bracket must be reversed as shown.

Operating the Controls

Note. *To activate the remote unit from the remote location, depress the Remote switch on the remote unit. Once doing so, the following conditions exist.*

1 – Speaker. Built in, front mounted speaker. Continues to sound even though the main unit (CTX 7800) Remote switch is set to Off (released) position.
2 – Keyboard. The keyboard consists of digit keys 0 through 9, priority keys of 13, 06, 16 and function keys of W, MW, and MR. Certain keys have secondary functions described by a character on the particular key.
It should be noted that the keyboard entry is possible either from main or remote unit even while the main unit Remote switch is set to Off (released) position.
3 – LED digital channel readout window. Shows channel selected, indicates whether unit is in the USA or international frequency mode.
4 – Microphone.
5 – Transmit switch (push-to-talk). Depress to transmit.
6 – Meter. Used to indicate the relative strength of an incoming signal (when receiving) and the relative RF power output (when transmitting). This meter can work even when the remote unit is off.
7 – Microphone jack. Accepts the connector from the microphone with the remote unit. The jack has a locating key which permits the mic connector inserted in only one way. Align mic connector into the key without using force.
8 – Off/Volume control. Turns the power on and adjusts the sound output from the built-in or external speaker. To switch the remote unit off, rotate the knob fully counterclockwise until a click is heard. While you are using the optional telephone type handset, the Volume control has no effect on handset loudness since the handset volume is fixed.
The Volume control and the built in speaker are operative even while the main unit Remote switch is off.
9 – Squelch control. Operates in the same manner as the Squelch control on the main unit (CTX 7800). Inoperative when the remote unit is off.

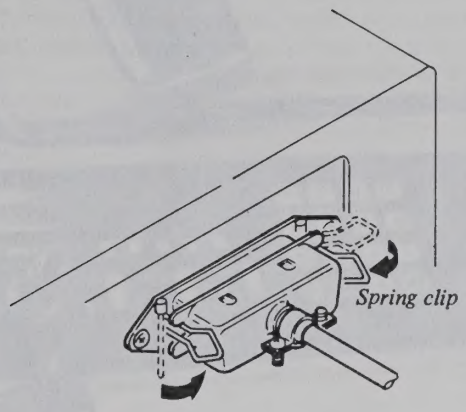
10 – Dimmer control. Lets you manually adjust front panel illumination.
11 – Pushbuttons. From left to right:
25W-1W pushbutton. Selects either 25W or 1W transmitting power of main unit (CTX 7800) when the main unit Remote switch is on (depressed). With this switch released (25W), the main unit will produce full rate transmitting power for longer range communications. The 1W setting (depressed) will produce 1W transmitting power for short range communications. This switch is deactivated when the main unit Remote switch is off (released).
Speaker-Off pushbutton. Deactivates the built in speaker when using optional telephone type handset or external speaker.
Remote pushbutton.
Dual Watch pushbutton. Depressing this pushbutton in allows the main unit receiver to start continuous scanning between main channel (selected on the keyboard) and channel 16.
USA/International. This switch has been incorporated to help preventing illegal operation on certain channels (transmitting in the USA on international-only frequencies for example). See **VHF FM marine radiotelephone channel Frequencies** chart in this manual.



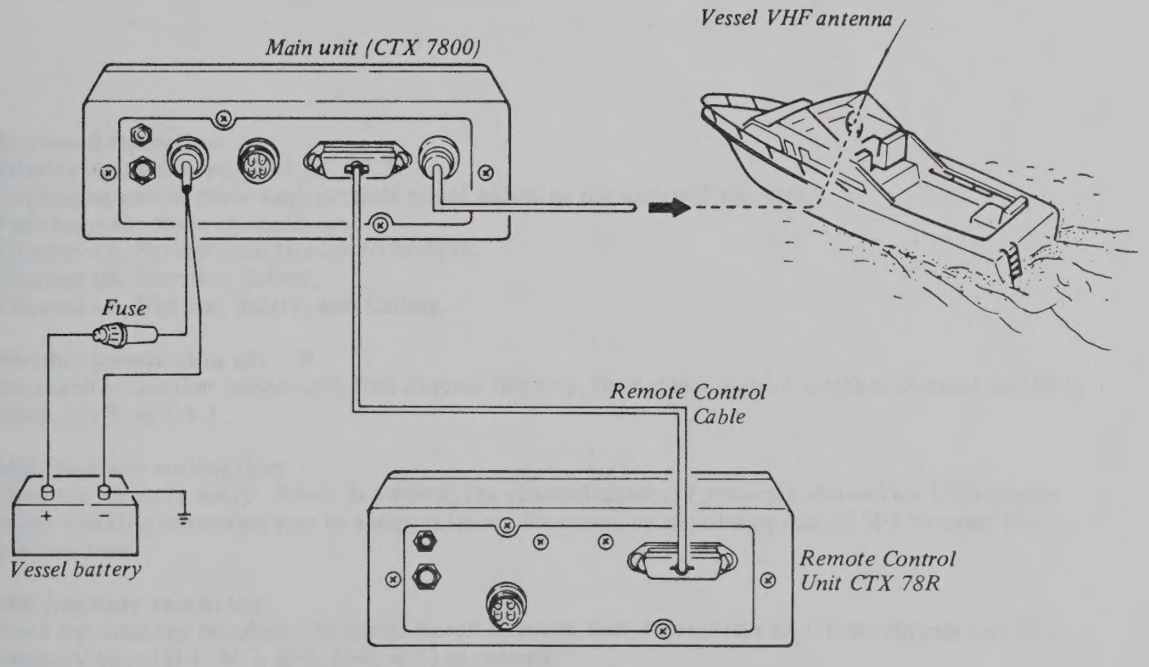
12 – External Speaker jack. Used for connection of an external speaker. Insertion of the speaker plug (standard, 1/8" 'phone' plug) into this jack will automatically silence the built in speaker. Sound from the external speaker is heard even when the main unit Remote switch is off.
13 – Remote/Speaker jack. Used for connection of a telephone type handset available optionally for use with the remote unit from your dealer.
14 – Auxiliary microphone jack. This connector is for use when the remote control unit is mounted flush into a cabinet overhead. The microphone may be remotely mounted next to the helm. When microphone is inserted to this jack, depressing the transmit switch (PTT) will key the transmitter.
15 – Main Unit Connector. Connection to the CTX 7800 main unit is made with this connector. This connector has spring clips to securely retain the multi-pin plug to it.

Connection to Main Unit CTX 7800

Attach one end of the remote connecting cable to the connector on the rear of the CTX 7800 main unit, marked **Remote Control**. Use the spring clips to securely retain the multi-pin plug so that the clips snap into the plug as shown below.



Route the cable to the location where the remote control unit is installed and attach the other end of the cable to the connector marked **Remote Control**, also. Use spring clips to secure the multi-pin plug to the connector.



Operation

Note. *For modes of operation, please refer to your CTX 7800 main unit operations manual pages 5 thru 9.*

Keyboard Operation
Priority channel keys: PRI 13, 06, 16
Depressing one of these keys permits direct access to the assigned channel.
Functions for these channels are:
Channel 13, Navigational (bridge to bridge).
Channel 06, Intership Safety.
Channel 16, Distress, Safety, and Calling.

Weather preselection key: W
To monitor weather broadcasts, first depress this key, then select desired weather channel on US-1, US-2, US-3, or CA-1.

MW (memory writing) key
Used for memory entry. When depressed, the channel number (presently shown) on LED display starts blinking informing you to assign memory locations by depressing one of M-1 through M-5 pushbuttons.

MR (memory recall) key
Used for memory recalling. To recall stored channel, first depress this key, then depress one of memory keys (M-1, M-2, M-3, M-4, M-5) as desired.

To select normal channels
i.e. to select channel 22:
1 – First set the USA/Int switch as required.
2 – Depress key marked '2' twice. The channel readout should now show '22'.
i.e. to select channel 65:
1 – First select the USA/Int switch as required.
2 – Depress key marked '6' then key marked '5'.
3 – Now the channel readout should show '65'.
Note. Should you have depressed illegal channel numbers (i.e. '37', '99' etc.), the unit reverts to channel 16 automatically. This prevents illegal channel operation.

Power On
First make sure that the connecting cable between the main unit CTX 7800 and the remote unit is firmly seated to the connectors on each rear panel, using the spring clips to securely retain the connectors to the jacks.
Important:
Turn on the main unit only after finishing the cable connection.
Should the connecting cable ever be connected after the units are turned on, the remote unit will be set to channel 16 but the main and remote unit LED may indicate a channel which was selected before the main unit was turned off. This is easily remedied by selecting a channel on key board of either unit. The correct channel number will now be displayed.

After depressing the Remote switch on the remote unit, the following controls are still operative on the remote unit even though the main unit Remote switch is in the Off position.

With the main unit CTX 7800 and the remote unit CTX 78R connected as outlined, and both power turned on, the following remote unit controls are operative regardless of the **Remote** switch on the main unit.

Volume control. The sound output from the remote unit speaker is heard and adjustable with the Volume control on the remote unit.

Keyboard entry. Operates in the same manner as of the main CTX 7800. This fact should be acknowledged to your crew so that the channel you have selected is not interrupted by accidental keyboard operation from the main unit location.

Sound output to the Handset receptacle. If you are using the optional handset (prewired at Cybernet and available from your marine dealer), a fixed sound output is obtained from the microphone jack regardless of the Volume control on the remote unit.

Technical Informations

As an aid to the service technician, this manual contains a schematic diagram, PC board diagrams, instructions for adjusting the potentiometers. Also included is the replacement part list.

Alignment Procedures

1 – Meter Alignment

Set the main unit to TX condition. Set the main unit HI/LO power switch to HI (25W) position; Remote switch to Off position. Rotate RV-2 on remote unit PC board PTZZ077H1X so that the meter on the remote unit reads RF power same as read on main unit meter.

2 – Handset Audio Output Alignment

Connect voltmeter or VTVM across terminal #3 of microphone jack (J-1 or J-2) and ground. Connect 8 Ohm resistor parallel to it (as a dummy load). Apply main unit a 60 dB RF signal with 5 kHz deviation from 1 kHz audio from a signal generator. Rotate RV-1 on the remote unit PC board PTZZ077H1X for 100 mW output (Approx. 0.89V @ 8 Ohm load).

COMPREHENSIVE VHF-FM MARINE RADIOTELEPHONE CHANNELS . . . by Designator

OPERATING CHANNEL DESIGNATIONS		FREQUENCY (MHz)		TYPE OF TRAFFIC	FUNCTION	
ORIGINAL	ADDITIONAL	SHIP TX	COAST TX		SHIP/SHIP	SHIP/SHORE
1		156.05	160.65	International Only	–	Yes
2		156.1	160.7	International Only	–	Yes
3		156.15	160.75	International Only	–	Yes
4		156.2	160.8	International Only	–	Yes
5		156.25	160.85	International Only	–	Yes
6		156.3	–	SAFETY	Yes	No
7		156.35	160.95	International Only	–	Yes
7A		156.35	156.35	Commercial	Yes	Yes
8		156.4	–	Commercial	Yes	No
9		156.45	156.45	Commercial	Yes	Yes
9		156.45	156.45	Non-Commercial	Yes	Yes
10		156.5	156.5	Commercial	Yes	Yes
11		156.55	156.55	Commercial	Yes	Yes
12		156.6	156.6	Port Operations, USCG	Yes	Yes
13		156.65	156.65	Locks, Canals, Pilots	Yes	Yes
14		156.7	156.7	Port Operations, USCG	Yes	Yes
15		156.75	156.75	Environ., Hydrographic	Ship Receive Only	Ship Receive Only
16		156.8	156.8	DISTRESS CALLING	Yes	DISTRESS CALL
17		156.85	156.85	State Control Restricted	No	Yes
18		156.9	161.5	International Only	Yes	Yes
18A		156.9	156.9	Commercial	Yes	Yes
19		156.95	161.55	International Only	Yes	Yes
19A		156.95	156.95	Commercial	Yes	Yes
20		157.0	161.6	Port Operations	No	Yes
21		157.05	161.65	International Only	–	Yes
21CG		157.05	157.05	USCG Restricted	Yes	Yes
22		157.1	161.7	International Only	–	Yes
22CG		157.1	157.1	USCG Restricted	Yes	Yes
23		157.15	161.75	International Only	–	Yes
23CG		157.15	157.15	USCG Restricted	Yes	Yes
24		157.2	161.8	Public Corresp.	No	Yes
25		157.25	161.85	Public Corresp.	No	Yes
26		157.3	161.9	Public Corresp.	No	Yes
27		157.35	161.95	Public Corresp.	No	Yes
28		157.4	162.0	Public Corresp.	No	Yes
	60	156.025	160.625	International Only	Ship Receive Only	Ship Receive Only
	61	156.075	160.675	International Only	"	"
	62	156.125	160.725	International Only	"	"
	63	156.175	160.775	International Only	"	"
	64	156.225	160.825	International Only	"	"
	65	156.275	160.875	International Only	Yes	Yes
	65A	156.275	156.275	Port Operations	Yes	Yes
	66	156.325	160.925	International Only	Yes	Yes
	66A	156.325	156.325	Port Operations	Yes	Yes
	67	156.375	–	Commercial	Yes	No
	68	156.425	156.425	Non-Commercial	Yes	Yes
	69	156.475	156.475	Non-Commercial	Yes	Yes
	70	156.525	–	Non-Commercial	Yes	No
	71	156.575	156.575	Non-Commercial	Yes	Yes
	72	156.625	–	Non-Commercial	Yes	No
	73	156.675	156.675	Port Operations	Yes	Yes
	74	156.725	156.725	Port Operations	Yes	Yes
	75	GUARD CHANNEL		–	–	–
	76	GUARD CHANNEL		–	–	–
	77	156.875	–	Commercial	Yes	No
	78	156.925	161.525	International Only	Yes	Yes
	78A	156.925	156.925	Non-Commercial Only	No	Yes
	79	156.975	161.575	International Only	Yes	Yes
	79A	156.975	156.975	Commercial	Yes	Yes
	80	157.025	161.625	International Only	Yes	Yes
	80A	157.025	157.025	Commercial	–	Yes
	81	157.075	161.675	International Only	–	Yes
	82	157.125	161.725	International Only	–	Yes
	83	157.175	161.775	International Only	–	Yes
	83CG	157.175	157.175	USCG Aux. Only	Yes	Yes
	84	157.225	161.825	Public Corresp.	No	Yes
	85	157.275	161.875	Public Corresp.	No	Yes
	86	157.325	161.925	Public Corresp.	No	Yes
	87	157.375	161.975	Public Corresp.	No	Yes
	88	157.425	162.025	International Only	Yes	Yes
	88A	157.425	–	Commercial	Yes	No
WE_1		–	162.55	NOAA Weather	Ship Receive Only	Ship Receive Only
	WE_2	–	162.4	NOAA Weather	"	"
WE_3		–	162.475	"	"	"
	WE_4	–	161.650	"	"	"

Check locally for Channels Authorized or used in your Area.

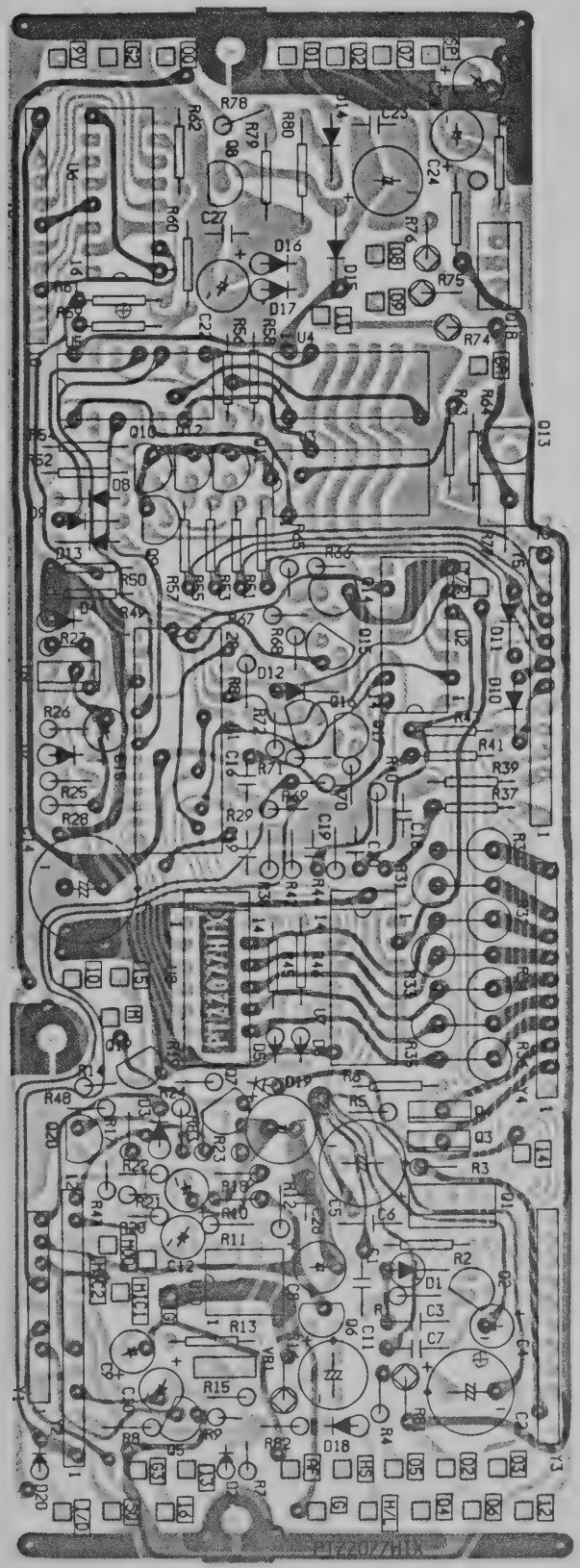
USA VHF-FM MARINE RADIOTELEPHONE CHANNELS . . . by Function

OPERATING CHANNEL DESIGNATORS		FREQUENCY (MHz)		POINTS OF COMMUNICATION	TYPE OF TRAFFIC
ORIGINAL	ADDITIONAL	SHIP TX	COST TX		
DISTRESS, SAFETY AND CALLING					
16		156.8	156.8	Ship/Ship, Ship/Shore	DISTRESS CALLING
INTERSHIP SAFETY					
6		156.3	156.3	Ship/Ship	SAFETY
NAVIGATIONAL BRIDGE TO BRIDGE					
13		156.65	156.65	Ship/Ship, Ship/Shore	Locks, Canals, Pilots, Bridges
ENVIRONMENTAL					
15		–	156.75	Shore to Ship, Rev Only	Environ., Hydrographic
STATE CONTROL					
17		156.85	156.85	Ship/Shore	RESTRICTED
PORT OPERATIONS					
12		156.6	156.6	Ship/Ship, Ship/Shore	USCG
14		156.7	156.7	"	USCG, Port Auth.
20		157.0	161.6	Ship/Shore Only	Port Operations, USA
	65A	156.275	156.275	Ship/Ship, Ship/Shore	"
	66A	156.326	156.325	"	"
	73	156.675	156.675	"	"
	74	156.725	156.725	"	"
COMMERCIAL					
7A		156.35	156.35	Ship/Ship, Ship/Shore	Commercial, USA
8		156.4		Ship/Ship Only	"
9		156.45	156.45	Ship/Ship, Ship/Shore	"
10		156.5	156.5	"	"
11		156.55	156.55	"	"
18A		156.9	156.9	"	"
19A		156.95	156.95	"	"
	67	156.375	–	Ship/Ship Only	Work boats
	77	156.875	-	"	Commercial, USA
	79A	156.975	156.975	Ship/Ship, Ship/Shore	"
	80A	157.025	157.025	"	"
	88A	157.425	-	Ship/Ship Only	Fishing Vessels
NON-COMMERCIAL					
9		156.45	156.45	Ship/Ship, Ship/Shore	Clubs, Marinas, Yards, etc.
	68	156.425	156.425	Ship/Ship, Ship/Shore	Yachts
	69	156.475	156.475	Ship/Ship, Ship/Shore	Clubs, Marinas, Yards, etc.
	70	156.525	-	Ship/Ship Only	Yachts
	71	156.575	156.575	Ship/Ship, Ship/Shore	Clubs, Marinas, Yards, etc.
	72	156.625	–	Ship/Ship Only	Yachts
	78A	156.925	156.925	Ship/Shore Only	Clubs, Marinas, Yards, etc.
	83CG	157.175	157.175	Ship/Ship„Ship/Shore	USCG Aux. Only
PUBLIC CORRESPONDENCE					
24		157.2	161.8	Ship/Public Coast	Telephone Corresp.
25		157.25	161.85	"	"
26		157.3	161.9	"	"
27		157.35	161.95	"	"
28		157.4	162.0	"	"
	84	157.225	161.825	"	"
	85	157.275	161.875	"	"
	86	157.325	161.925	"	"
	87	157.375	161.975	"	"
NOAA WEATHER SERVICE					
WE_1		–	162.55	Ship Receive Only	Weather Broadcasts
	WE_2	–	162.4	"	"
WE_3		–	162.475	Ship Receive Only	Weather Broadcasts
	WE_4	–	162.650	"	"

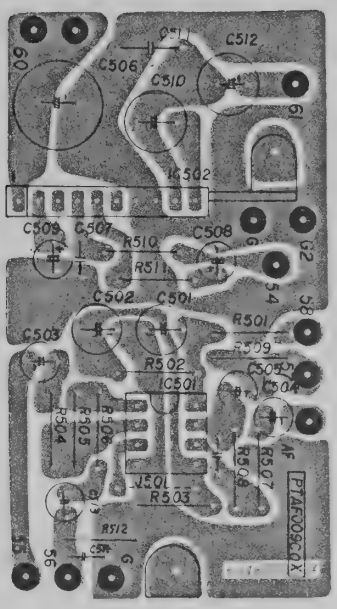
Check locally for Channels Authorized or used in your Area.

PC Board Diagrams

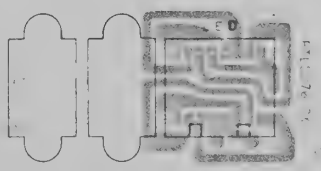
PTZZ077



PTAF009



PTLD076



Replacement Part List

	PART NAME	PART CODE	
	ELEC. ELEMENTS	WF806AACAL1	

ITEM	REMARKS	PART CODE	PART, STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC				QTY USED
1		ACCN223GEA		CONN CORD ASSY		AC2				1
2		ACCN224GEA		CONN CORD ASSY		AC3				1
3	EXPLODED	APTAF009BA		P.W.BOARD ASSY						1
4	EXPLODED	APTLD076BA		P.W.BOARD ASSY						1
5	EXPLODED	APTZZ077DA		P.W.BOARD ASSY						1
6		CKDB102PEM		CERAMIC CAP.	1000PF 50V -0, +100% E	C2	C3	C4	C5	8
7						C6	C7	C8	C9	
8		CKDB103PE4		CERAMIC CAP.	0.01MFD 50V -0, +100% E	C1	C10	C11		3
9		CQMB473KEH		MYLAR CAPACITOR	0.047MFD 50V -10, +10%	C12				1
10		GCTX78RA01		WIRES KIT						1
11		QDSMA150XN		SILICON DIODE	MA150 VF=1.2V,VR=35V NO-RANK 24MIN	D1				1
12		RVNA203BDB		VR.		VR2				1
13		RVNB103A12		VR.		VR1/S1				1
14		RVQA5J2B02		V.R		VR3-4				1
15		SK1644A04M		KEY BORD Sw						1
16		SP05EAX03A		PUSH SWITCH		S2-S6				1
17		YJF24S001Z		JACK		J5				1
18		YJS04S003Z		JACK		J3				1
19		YJT03S003Z		3P JACK		J4				1
20		YJZ04S008Z		4P MIC JACK		J1	J2			2
21		ZMJ2030N19		METER 16B36L		M1				1

	PART NAME	PART CODE	
	ACCESSORIES	WFB06AACAL5	

ITEM	REMARKS	PART CODE	PART, STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC				Q'TY USED
1		BTPP4010AN		PAN TAP SCREW	(+)BIT, M4 X 10 S-NI					2
2		BTPT5013AZ		TRUSS TAP SCREW	(+)BIT, M5 X 13 S-ZNCR					4
3		BWG50A06SW		IT. LOCK WASHER	OUTSIDE TOOTHED, 5M/M S-ZN					4
4		BWM50C0ABN		FLAT L WASHER						4
5		BWU40855SW		IT. LOCK WASHER	INSIDE TOOTHED, 4 M/M S-ZN					2
6		MF284SN004		SCREW						2
7		MU586SM003		BRACKET						1
8		MZ331SN001		HOLDER						1
9		VS556RW001		SHEET						2
10	EXPLODED	ZGAAZ501G0		MICROPHONE						1
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										

	PART NAME	PART CODE	
	P.W.BOARD ASSY	APTAF0098A	

ITEM	REMARKS	PART CODE	PART, STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC	QTY USED
1		BSPB30O6NS		BIND HEAD SCREW	(+)BIT, M3 X 6 BS-NI		3
2		CEAD100ZMN		ELYT. CAPACITOR	10MFD 16V MS	C508 C509	2
3		CEAD102ACN		ELYT. CAPACITOR		C506	1
4		CEAD221AMN		ELYT. CAPACITOR	220MFD 16V Z-SERIES	C512	1
5		CEAD470ZMN		ELYT. CAPACITOR	47MFD 16V MS	C510	1
6		CQMB103KEH		MYLAR CAPACITOR	0.01MFD 50V -10, +10%	C507	1
7		CQMB104KEH		MYLAR CAPACITOR	0.1MFD 50V -10, +10%	C511	1
8		MS313AC001		HEAT SINK			1
9		MU365SZ001		PCB BRACKET			1
10		MW2013SJ02		TERMINAL			4
11		PTAFJC98JX		PRINTED.W.BOARD			1
12		QQM07222AT		I.C.	TA7222AP DACKAGE CYB.-MARK	IC502	1
13		RD25RJ103X		CARBON FILM R.	0.25W 10K OHM 5%	R510	1
14		RD25RJ331X		CARBON FILM R.	0.25W 330 OHM 5%	R511	1
15							
16							
17							
18							
19							
20							
21							

	PART NAME	PART CODE	
	P.W.BOARD ASSY	APTLD076BA	

ITEM	REMARKS	CYBERNET PART CODE	CUSTOMER'S PART, STOCK NUMBER	CYBERNET PART NAME	SPECIFICATIONS	SYMBOLIC				QTY USED
1		ACCN436GFA		CONN. CORD ASSY						1
2		PTLD076CJX		PRINTED W.BOARD						1
3		QLML22715C		LED	CTX-5500	LED601				1
4		VK122RW011		LAMP HOLDER						2
5		ZPA064137U		LAMP		PL603				1
6		ZPA064138U		LAMP		PL601	PL602	PL604		3
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										

	PART NAME	PART CODE	
	P.W.BOARD ASSY	ADTZZ0776A	

ITEM	REMARKS	PART CODE	PART, STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC				QTY USED
1		BSP33J06YS		BIND HEAD SCREW	(+)BIT, M3 X 6 BS-NI					1
2		CBD1B1J4M4		CERAMIC CAP.	0.1MFD 12.5V -20, +20%	C23	C7			2
3		CBD1E473M4		CERAMIC CAP.	0.047MFD 25V -20, +20%	C1	C3	C6		3
4		CCD470KPM		CERAMIC CAP.	47PF 50V -10, +10% PH	C16				1
5		CEAC330ALX		ELYT. CAPACITOR	33MFD 10V	C8				1
6		CEAD1C0ALX		ELYT. CAPACITOR	10MFD 16V	C4				1
7		CEAD1D1ALX		ELYT. CAPACITOR	100MFD 16V	C11	C21	C24		3
8		CEAD1J2ALX		ELYT. CAPACITOR	1000MFD 16V	C14				1
9		CEAD220ALX		ELYT. CAPACITOR	22MFD 16V	C22				1
10		CEAD330ALX		ELYT. CAPACITOR	33MFD 16V	C25				1
11		CEAD471AGX		ELYT. CAPACITOR	470MFD 16V S-SERIES	C5				1
12		CEAD471ALX		ELYT. CAPACITOR	470MFD 16V	C2				1
13		CEAE470ALX		ELYT. CAPACITOR	47MFD 25V	C28				1
14		CEAG010ALX		ELYT. CAPACITOR	1MFD 50V	C10	C9			2
15		CEAG2R2ALX		ELYT. CAPACITOR	2.2MFD 50V	C15				1
16		CKD91H3P5M		CERAMIC CAP.	0.01MFD 50V -0, +100% E	C17	C18	C19	C20	5
17						C27				
18		CQMB103KFH		MYLAR CAPACITOR	0.01MFD 50V -10, +10%	C26				1
19		ML321AD101		HEAT SINK						1
20		MW201BS002		TERMINAL						22
21		MW401CX001		SHORT JUMPER	Jw-10					1

	PART NAME	PART CODE	
	P.W.BOARD ASSY	APTZZ077BA	

ITEM	REMARKS	PART CODE	PART, STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC				QTY USED
1		MW401CX002		SHORT JUMPER						1
2		MW401CX003		SHORT JUMPER						1
3		MW401CX004		SHORT JUMPER	JW-5					1
4		PTZZ077H1X		P.W.BOARD						1
5		QDSMA150XN		SILICON DIODE	MA150 VF=1.2V,VR=35V NO-RANK 24MIN	D10	D11	D12	D13	13
6						D14	D16	D18	D20	
7						D5	D6	D7	D8	
8						D9				
9		QDSSR1KX4P		SILICON DIODE	SR1K-4 VR=200 4-RANK 25MIN	D15				1
10		QDZMZ304AE		ZENER. DIODE	MZ304A	D4				1
11		QDZMZ409CE		ZENER DIODE	MZ409-02-C C-RANK	D17				1
12		QQM01288AC		I.C.	LB1288 DEGID-DRIVER	U7	U8			2
13		QQM04558AJ		I.C.	NJM4558D OPERATIONAL AMP.	U10				1
14		QQM51204AE		I.C.	M51204L	U9				1
15		QQP73ASLAU		I.C.	MP0073ASL	U1				1
16		QQD04011AA		I.C.	UPD4011C QUADRUPLE 2-INPUTNAND GATE	U2				1
17		QQD04012AA		I.C.	UPD4012C	U3	U4			2
18		QQD04081AA		I.C.	UPD4081C QUADRUPLE 2-INPUT AND GATE	U5				1
19		QTA0733XCA		TRANSISTOR	2SA733 Q,R-RANK	Q10	Q11	Q12	Q15	6
20						Q16	Q9			
21		QTB0632XAC		TRANSISTOR	2SB632(E RANK)	Q3	Q4			2

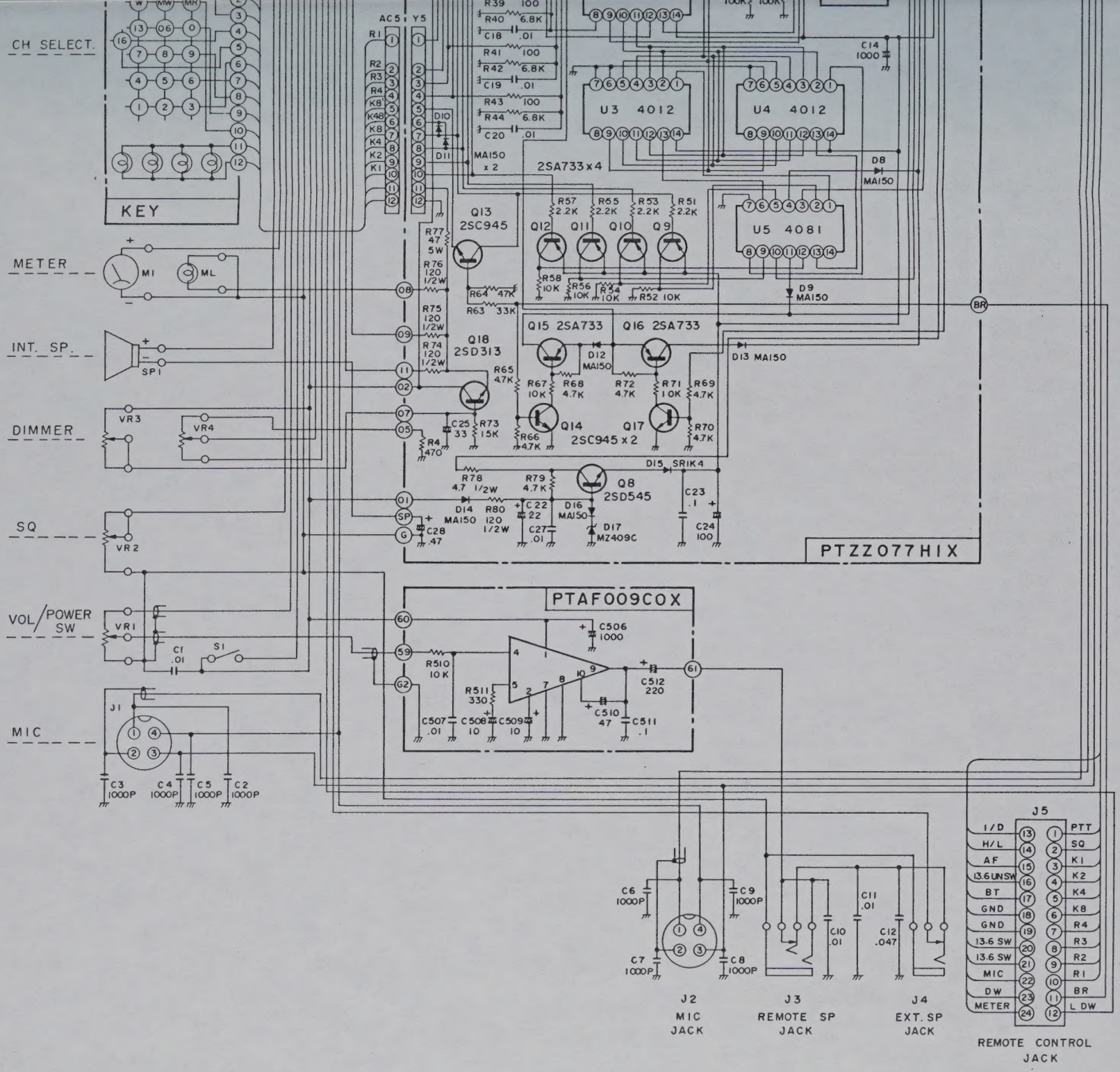
	PART NAME	PART CODE	
	P.W.BOARD ASSY	APTZZ0778A	

ITEM	REMARKS	PART CODE	PART, STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC				QTY USED
1		QTC0945AEA		TRANSISTOR	2SC945A P,Q-RANK	Q13	Q14	Q17	Q2	5
2						Q20				
3		QTD0313XAC		TRANSISTOR	2SD313 C,D-RANK	Q1	Q18			2
4		QTD0545XAC		TRANSISTOR	2SD545 E-RANK	Q6	Q8			2
5		QVESV03XXD		VARISTOR	SV03 NO-RANK (VF:1.60V-2.00V)	D1				1
6		RD25PJ101X		CARBON FILM R.	0.25W 100 OHM 5%	R37	R39	R41	R43	4
7		RD25PJ102X		CARBON FILM R.	0.25W 1K OHM 5%	R73				1
8		RD25PJ103X		CARBON FILM R.	0.25W 10K OHM 5%	R13	R52	R54	R56	5
9						R58				
10		RD25PJ222X		CARBON FILM R.	0.25W 2.2K OHM 5%	R45	R46	R51	R53	7
11						R55	R57	R6		
12		RD25PJ333X		CARBON FILM R.	0.25W 33K OHM 5%	R63				1
13		RD25PJ472X		CARBON FILM R.	0.25W 4.7K OHM 5%	R79				1
14		RD25PJ473X		CARBON FILM R.	0.25W 47K OHM 5%	R64				1
15		RD25VJ101X		CARBON FILM R.	0.25W 100 OHM 5%	R10	R15			2
16		RD25VJ102X		CARBON FILM R.	0.25W 1K OHM 5%	R28				1
17		RD25VJ103X		CARBON FILM R.	0.25W 10K OHM 5%	R17	R67	R71		3
18		RD25VJ104X		CARBON FILM R.	0.25W 100K OHM 5%	R49	R50			2
19		RD25VJ222X		CARBON FILM R.	0.25W 2.2K OHM 5%	R5				1
20		RD25VJ302X		CARBON FILM R.	0.25W 3K OHM 5%	R11				1
21		RD25VJ332X		CARBON FILM R.	0.25W 3.3K OHM 5%	R12				1

	PART NAME	PART CODE	
	P.W.BOARD ASSY	APTZZ0778A	

ITEM	REMARKS	PART CODE	PART, STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC				QTY USED
1		RD25VJ471X		CARBON FILM R.	0.25W 470 OHM 5%	R1	R4			2
2		RD25VJ472X		CARBON FILM R.	0.25W 4.7K OHM 5%	R25	R47	R48	R65	9
3						R66	R68	R69	R70	
4						R72				
5		RD25VJ473X		CARBON FILM R.	0.25W 47K OHM 5%	R29				1
6		RD25VJ561X		CARBON FILM R.	0.25W 560 OHM 5%	R20	R21	R3		3
7		RD25VJ562X		CARBON FILM R.	0.25W 5.6K OHM 5%	R27				1
8		RD25VJ681X		CARBON FILM R.	0.25W 680 OHM 5%	R26				1
9		RD25VJ682X		CARBON FILM R.	0.25W 6.8K OHM 5%	R38	R40	R42	R44	4
10		RF03SK470B		WIRE WOUND R.	3W 47 OHM 10%	R77				1
11		RGHANJ121B		M-OXIDE FILM R.	1/2W 120 OHM 5%	R74	R75	R76	R80	4
12		RG1ANJ101B		M-OXIDE FILM R.	1W 100 OHM 5%	R16				1
13		RG1ANJ181B		M-OXIDE FILM R.	1W 180 OHM 5%	R2				1
14		RG2ANJ470B		M-OXIDE FILM R.	2W 47 OHM 5%	R30	R31	R32	R33	7
15						R34	R35	R36		
16		RPFNB20301		SEMI-FIXED VR.	20K OHM B-CURVE	RV1				1
17		RPPNB50201		SEMI-FIXED VR.	5K OHM B-CURVE	RV2				1
18		RXHANJ4R7B		M-OXIDE FILM R.	1/2W 4.7 OHM 5%	R78	R81			2
19		WTG503AAXX		SOLID WIRE		J3				1
20		WTG505AAXX		SOLID WIRE		J2				1
21		VJF10S004Z		JUNCTION JACK.		Y3	Y4			2

Acoustic Display


CH SELECT.
KEY
METER
MI
ML
INT. SP.
SP1
DIMMER
VR3
VR4
SQ
VR2
VOL/POWER SW
VR1
C1 .01
S1
MIC
J1
C3 1000P
C4 1000P
C5 1000P
C2 1000P
AC5
Y5
R1
R2
R3
R4
K8
K48
K8
K4
K2
K1
R39 100
R40 6.8K
C18 .01
R41 100
R42 6.8K
C19 .01
R43 100
R44 6.8K
C20 .01
D10
D11
MA150 x 2
2SA733x4
U3 4012
U4 4012
C14 1000
D8 MA150
R57 2.2K
R55 2.2K
R53 2.2K
R51 2.2K
Q12
Q11
Q10
Q9
U5 4081
R58 10K
R56 10K
R54 10K
R52 10K
D9 MA150
Q13 2SC945
R77 47 5W
R76 120 1/2W
R75 120 1/2W
R74 120 1/2W
R64 47K
R63 33K
Q18 2SD313
R65 4.7K
Q15 2SA733
Q16 2SA733
D12 MA150
D13 MA150
R67 10K
R68 4.7K
R72 4.7K
R71 10K
R69 4.7K
Q14
Q17
2SC945 x2
R66 4.7K
R70 4.7K
C25 33
R73 15K
R4 470
D15 SRIK4
R78 4.7 1/2W
R79 4.7K
Q8 2SD545
D14 MA150
R80 120 1/2W
C22 22
D16 MA150
C27 .01
D17 MZ409C
C23 .1
C24 100
C28 .47
PTZZ077HIX
PTAF009COX
C506 1000
R510 10K
R511 330
C507 .01
C508 10
C509 10
C512 220
C510 47
C511 .1
C6 1000P
C9 1000P
C7 1000P
C8 1000P
C11 .01
C10 .01
C12 .047
J2 MIC JACK
J3 REMOTE SP JACK
J4 EXT. SP JACK
J5
I/D
H/L
AF
13.6UNSW
BT
GND
GND
13.6 SW
13.6 SW
MIC
DW
METER
PTT
SQ
K1
K2
K4
K8
R4
R3
R2
R1
BR
L DW
REMOTE CONTROL JACK